

Idaho 8th Grade Direct Mathematics Assessment

2004 8th GRADE MAIN RANGEFINDER 2

It is important that you show or explain how you solved the problems on this assessment. If you use a calculator, show how you set up the math.

1. Shauna has scores of 68, 92, 96, 78, 100, 93, and 86 on her math tests so far this semester.

| GRADE SCALE | |
|-------------|--------------|
| A = | 90 and above |
| B = | 80 – 89 |
| C = | 70 – 79 |
| D = | 60 – 69 |

Limited Process Development

- a. If Shauna's father gives her \$5.00 for every A, \$2.00 for every B, nothing for a C, and Shauna must give her father \$1.00 for every D, how much money would she have from this? Show or explain how you found your answer.

$$\begin{array}{r} 68 \quad 92 \quad 96 \quad 100 \quad 93 \quad 86 \\ - \quad - \quad - \quad - \quad - \quad - \\ 22.00 \end{array}$$

$A = \$5.00$
 $B = \$2.00$
 $C = \$0.00$
 $D = -\$1.00$

$\$22.00 + \$2.00 = \$24.00$

- b. What is her average (mean) test score and letter grade? Show or explain how you found your answer.

$$\begin{array}{r} 100 \\ 96 \\ 93 \\ 92 \\ 88 \\ 86 \\ 78 \\ 68 \\ 613 \end{array}$$

88%

- c. Shauna's lowest score is what percentage of her total points? Show or explain how you found your answer.

$$\begin{array}{r} 100 \\ 96 \\ 93 \\ 92 \\ 88 \\ 86 \\ 78 \\ 68 \\ 613 \end{array}$$

14%

- d. If one more 100-point test is given, what would be her highest possible average (mean)? If two more 100-point tests are given, what would be her highest possible average (mean)? Show or explain how you found your answer.

$$\begin{array}{r} 68 \\ 92 \\ 96 \\ 100 \\ 93 \\ 86 \\ 78 \\ 68 \\ 613 \end{array}$$

89%

Adequate Solutions and Processes

$$\begin{array}{r} 68 \\ 92 \\ 96 \\ 100 \\ 93 \\ 86 \\ 78 \\ 68 \\ 613 \end{array}$$

90%

$$\begin{array}{r} 613 \\ + 100 \\ \hline 713 \end{array}$$
$$\begin{array}{r} 613 \\ + 100 \\ \hline 813 \end{array}$$

Read problems 2, 3, 4, and 5 on this and the next two pages. Select three problems to answer. Answer ALL of the parts of the three problems you select to answer. Cross out the one problem that you do not choose to answer.

2. Given the following sequence: 1, 4, 9, 16, ... 25 36 ...

- a. Find the next three terms (numbers) in the sequence.

25
36
49

$$\begin{array}{r}
 4-1=3 \\
 9-4=5 \\
 16-9=7 \\
 25-16=9 \\
 36-25=11 \\
 49-36=13
 \end{array}
 \quad
 \begin{array}{r}
 49 \\
 -36 \\
 \hline
 13
 \end{array}
 \quad
 \begin{array}{r}
 36 \\
 -25 \\
 \hline
 11
 \end{array}
 \quad
 \begin{array}{r}
 25 \\
 -16 \\
 \hline
 9
 \end{array}
 \quad
 \begin{array}{r}
 9 \\
 -9 \\
 \hline
 0
 \end{array}$$

- b. What is the relationship between the numbers? Show or explain the pattern.

The pattern goes up by 3's

it could be 1, then 4, then 9

Limited Communication Skills

Demonstrates Basic Use of Thinking Skills

- c. Find the mean and median of the seven numbers. Show or explain how you found your answer.

④ ⑦ ⑨ 16, ⑩, ⑪, ⑫

$$\begin{array}{r}
 20 \\
 7 \overline{) 140} \\
 14 \\
 \hline
 00
 \end{array}$$

Mean = 20
Median = 16

$$\begin{array}{r}
 4 \\
 49 \\
 +36 \\
 \hline
 25 \\
 16 \\
 09 \\
 04 \\
 01 \\
 \hline
 140
 \end{array}$$

- d. Find the probability of selecting an odd number from the seven numbers. Show or explain how you found your answer.

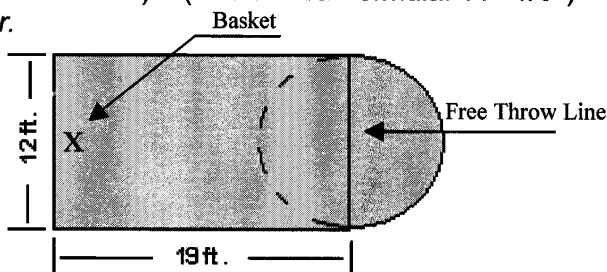
Limited Structure

55%

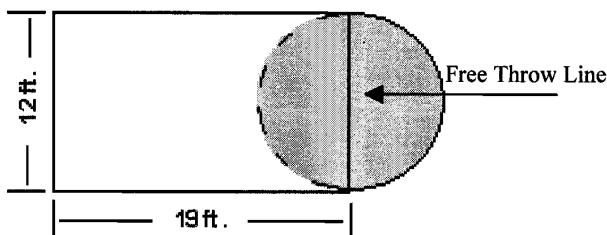
$$\begin{array}{r}
 1 \quad 4 \\
 9 \quad 16 \\
 25 \quad 36 \\
 49
 \end{array}$$

3. In the game of basketball, the "key" is the rectangular area underneath the basket. A school has decided to paint the key and the semicircle adjacent to and outside of the free throw line with the school's colors. The dimensions of the key are 12 ft by 19 ft as shown in the diagram.

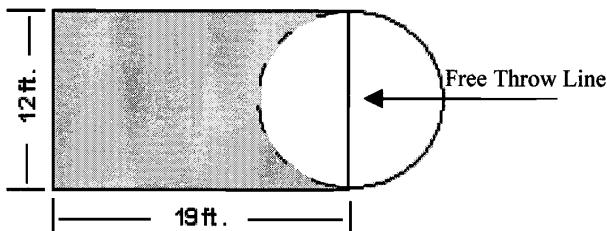
- a. What is the total area to be painted (key and semicircle)? (Circle Area Formula: $A = \pi r^2$)
Show or explain how you found your answer.



- b. The school will paint the circle orange that has the free throw line as the diameter. What is the area that needs to be painted orange? *Show or explain how you found your answer.*



- c. The remaining area of the key is to be painted black. What is the area that needs to be painted black? *Show or explain how you found your answer.*



- d. The cost of the paint is \$2.50 per sq. ft. of coverage. How much would it cost to paint the key and the adjacent semicircle? *Show or explain how you found your answer.*

4. Suppose you plan to work 3 hours after school each Monday, Wednesday, and Friday, and 6 hours each Saturday. Suppose you will earn x dollars per hour.
- a. Write an expression that represents your weekly earnings. Show or explain how you found your answer.

Limited Use of Problem-Solving Strategies

$$3x + 6x = x$$

- b. If you earn \$5.25 per hour, how much money will you earn each week? Show or explain how you found your answer.

$$\begin{array}{r} 47.25 \\ + 10.50 \\ \hline 57.75 \end{array} \quad \begin{array}{r} 5.25 \\ \times 3 \\ \hline 15.75 \end{array} \quad \begin{array}{r} 15.75 \\ \times 6 \\ \hline 557.75 \end{array}$$

- c. If 25% of your weekly check in part b is deducted for taxes, how much will you pay in taxes each week? Show or explain how you found your answer.

$$\$14.44$$

$$\begin{array}{r} 57.75 \\ \times .25 \\ \hline 14.44 \end{array}$$

Development Toward Proficiency of Basic Skills

5. An art teacher has a box of 36 markers on his desk that are black, red, green, blue, and purple.

- a. If 25% of the markers are blue and $\frac{1}{3}$ of the markers are black, how many markers are blue and how many markers are black? Show or explain how you found your answer.

$$\text{blue} = 9 \text{ markers}$$

$$\text{black} = 12 \text{ markers}$$

$$\begin{array}{r} 36 \\ \times .25 \\ \hline 9 \end{array} \quad \begin{array}{r} 36 \\ \times \frac{1}{3} \\ \hline 12 \end{array}$$

- b. If there are an equal number of red, green, and purple markers, how many green markers are in the box? Show or explain how you found your answer.

$$4 \text{ green markers}$$

$$\begin{array}{r} 12 \\ - 24 \\ \hline 12 \end{array} \quad \begin{array}{r} 12 \\ \times 9 \\ \hline 108 \end{array}$$

$$4 + 4 + 4 = 12$$

- c. If Johnny reaches into the box and grabs one marker without looking, what is the probability that the marker will be blue or red? Show or explain how you found your answer.

Frequent Computational or Surface Errors

$$\begin{array}{r} 32\% \\ 14\% \end{array}$$

$$\begin{array}{r} 36 \\ \times 9 \\ \hline 32 \end{array} \quad \begin{array}{r} 36 \\ \times 4 \\ \hline 14 \end{array}$$

Limited Understanding of Situations